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CHAPTER FOURTEEN:

GEOTEXTILES

Prior to 1988, geotextiles were called plastic filter cloth or filter fabric. Because of the increase in the number of products being manufactured to be used as filter cloth, the Specifications were revised. This material is now identified as "Geotextile". In this chapter, geotextiles for use under riprap and with underdrains will be discussed.

STORAGE AND HANDLING

Storage and handling of geotextiles is required to be as per the manufacturer's recommendations. INDOT also requires that the geotextiles be protected from the following:

- 1) Direct sunlight
- 2) Ultraviolet rays
- 3) Water
- 4) Temperatures greater than 140°F
- 5) Mud, dirt, and dust
- 6) Debris

Any of the above may affect the strength, toughness, and permeability of the geotextile.

Exposure of geotextiles to the elements between laydown and covering is required to be a maximum of 14 days. At the time of installation, the geotextile may be rejected and replaced if defective, ripped, flawed, deteriorated, or damaged. These problems may occur during construction, manufacturing, transportation, or storage of the geotextile.

PLACEMENT

The ground surface that receives the geotextiles is required to be prepared to a relatively smooth condition that is free of obstructions, depressions, or debris.

Geotextiles used along channels are required to be placed with the machine direction of the material parallel to the channel. If successive sheets are required, they are overlapped so that the upstream sheet is placed over the downstream sheet. If additional sheets are required to reach the top of the channel, the upslope sheet overlaps the downslope sheet.

Geotextiles used for 2 to 1 slopes or greater are required to be placed with the machine direction of the geotextile sheets perpendicular to the toe of the slope. The geotextile sheets are overlapped in the direction of the anticipated movement of the water. For example, on a foreslope the movement of the water is from the pavement and the geotextile sheets start at the bottom of the slope and proceed upslope.

OVERLAPPING AND PINNING

Adjacent pieces of geotextile may be joined by sewing or by overlapping. Most Contractors prefer overlapping. When geotextile sheets are overlapped they are required to be pinned. The minimum overlap is 18 in. When the geotextiles are placed under water, the minimum overlap is 3 ft. If an overlap is periodically subjected to being under water, the overlap is required to be 3 ft.

The overlaps are secured by pinning and the securing pins are required to be:

- 1) Steel
- 2) 3/16 in. in diameter
- 3) 18 in. long
- 4) Pointed at one end
- 5) Fabricated with a head to retain a steel washer. The washers are required to have an outside diameter of at least 1 1/2 in.

Securing pins are required to be inserted through both strips of overlapped geotextile. The pins are placed through the midpoint of the overlap. The spacing intervals of the pins are determined by the slopes the geotextile is being placed on in accordance with the following:

<u>SLOPE</u> <u>(Horizontal;Vertical)</u>	<u>PIN SPACING PER ROW</u> <u>(Center:Center)</u>
steeper than 3:1	2 ft
3:1 to 4:1	3 ft
4:1 or flatter	5 ft

The pins are driven until the washer bears against the geotextile so that the geotextile is secured firmly to the ground. Additional pins are installed as necessary to prevent any slippage of the fabric, of the location.

UNDERDRAINS

The geotextiles for underdrains are required to be inspected and handled in the same manner as the geotextiles for riprap. The overlap for geotextiles for underdrains is 1 ft and the upstream geotextiles always overlap the downstream geotextiles. As soon as the geotextile for the underdrains is placed, the trench is backfilled with the aggregate for the underdrains.

PLACEMENT

The geotextile is required to be placed such that the placement of the overlaying materials does not excessively stretch the geotextile, tear the geotextile, or pull the overlap or seam apart.

The following requirements are also verified by the technician:

- 1) Construction equipment is not allowed on the exposed geotextile.
- 2) Placement of riprap or stone is required to start at the base of the slope, and moves upward and from the center outward.
- 3) Riprap is not allowed to roll downslope.
- 4) The height drop for riprap is required to be less than 2 ft.

ACCEPTANCE OF MATERIALS

The geotextile used under riprap is required to be in accordance with Section **918.02** (Riprap) and Section **918.03** (Underdrains), and be on an approved list. The PE/PS is responsible for determining when geotextiles are sampled, if required.

MEASUREMENT AND PAYMENT

Geotextiles are measured in place, and the accepted quantities are in square yards. The payment for geotextiles is per the contract unit which normally is per square yard. The unit price includes excavation, grading, sewing, pinning, and all other incidentals required to complete the work.